The Evolution and Utility of Graphics Containing Statistics in NCAA Championship Broadcasts (1986-2016)

An Honors Thesis (HONR 499)

by

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Abstract

Televised broadcasts of college basketball, especially March Madness, continue to grow in popularity, as supported by television ratings in the past three decades since CBS was given the rights to the tournament. Thanks to advancement in technology, the network now has the ability to incorporate many new features to enhance fans' viewing experiences. This study analyzes how the utility of graphics that contain statistics have evolved within championship broadcasts. Starting in the mid-1980s and examining the championship game in five-year intervals up to the most recent title (1986-2016), the author documents evolution in the total number of graphics that appear on screen as well as their utility: the amount of screen space consumed, the length of the graphics' display on screen, and the type of statistic included. Findings reveal that graphics have become more prevalent in recent broadcasts and appear more varied in regards to content. These advancements have also improved the connection between the visual element displayed on screen and the on-air commentary, demonstrated by the length of time a broadcaster audibly highlights a statistic being displayed and the percentage of statistics used by the commentators that are accompanied by a graphic. This evolution has been beneficial in keeping viewers informed and entertained through the entirety of the broadcast, and it could be a key contributing factor in the overall popularity of March Madness.

Acknowledgments

First and foremost, I would like to thank my advisor, Dr. Adam Kuban, for all the time and energy spent to help this thesis come to fruition. From weekly meetings to input and advice from my original drafts all the way up through my final revisions, without your guidance this project would not resemble, what I am proud to call, the finished product that it is today.

I am also grateful to all the other professors and faculty at Ball State who have provided me with the knowledge and confidence to pursue this challenge.

Finally, none of this could have been possible without the support of my family and, most importantly, my parents. Thank you, Mom and Dad, for your constant support in all my endeavors.

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Process Analysis Statement

Confronting this thesis was one of the more unique and difficult challenges I have faced throughout my college experience. From the onset, I knew I wanted to cover a topic in sports broadcasting with a focus in statistics since these have been my two primary areas of study at Ball State University. Once the main point — the use of statistics in sports broadcasts — had been decided, I felt the most insightful way to address this topic in order to yield meaningful results would be to narrow down the study to one specific league while noting the changes and growth of the statistics in that particular sport.

The two sports I was most interested in analyzing were football or basketball. I am very knowledgeable about both, and those two each receive a lot of coverage, so I thought there would be plenty of resources and previous studies available to assist me along the way. After failing to acquire enough NFL game footage from the past few decades, I was able to find the NCAA basketball vault, which had many NCAA tournament games from each year dating back into the 1980s. After finding this database with full game tapes, I knew that I would have enough raw data to work with to be able to conduct my desired study.

After forming this foundation for my study, the next step was to create research questions that would become the specifics of what the study actually answers. The two research questions came about as a result of my interests and curiosities combined with previous research on similar topics. When it came time to do my original research, the amount of time and attention to detail that was required was definitely underestimated. When I sat down to analyze my first game tape, it took three hours to code one half, which only contained 35 minutes of film. Initially, I overlaid a grid in front of the monitor to accurately measure the size of the graphics, then used a calculator to compute percentages. A stopwatch was used to determine the length of time a

spoken or visual graphic was utilized. The measures taken for this to work was grueling, but it was also enjoyable analyzing prominent historical games.

Upon finishing my research, I was fortunate to have the opportunity to present my research at the Butler Undergraduate Research Conference and the Ball State University Research Symposium. At the Butler URC, I gave a 15-minute PowerPoint presentation, and at the Ball State Symposium, I constructed a poster outlining my research. Both events provided me a forum for comments and questions from people observing my process. Their critiques gave me fresh ideas and other considerations to include while discussing the study's implications. Some of the feedback I received included whether newer types of statistics are directed toward the casual or hard-core fan and what these new statistics could mean for future broadcasts.

Looking back at the process as a whole, a lot of work was put into this research, but it was a gratifying process. I am thankful for all the support and assistance I had along the way and am very proud of the work that I have accomplished. The knowledge acquired over the course of this study will propel me into future endeavors not only in the field of sports production but in several aspects of life. I did learn a lot about the progression of statistics in college basketball and the way they are presented, but I also learned how to set goals and better manage my time, breaking down a large project like this so that I could remain detailed throughout the piece. My hope is that this information will also be valuable to others and can provide them a basis for their own research or discussions about statistics in sports.

Introduction

March Madness is highly anticipated by sports fans for much of the year. College basketball's much-beloved post-season nickname is derived from the unexpected upsets and the last-second finishes that populate the early rounds of the NCAA tournament. The sheer size of the tournament and the lovable underdogs are just two reasons why March Madness is so popular, with a household rating of 14.2, meaning 14.2% of all televisions were tuned into the event (Bonesteel, 2018). Since 2011, the tournament has pitted 68 teams in the field (NCAA, 2011) in order to narrow the field. There are a handful of incredible games as a result, each with fascinating storylines and entertaining action.

In the 2016 NCAA tournament, for example, Northern Iowa (UNI) made a half-court shot as time expired in its first game of the tournament, beating the better-seeded Texas Longhorns. The shot was easily the best shot of the tournament and one of the best shots of all time (Foxsports, 2016). Primarily it was an unpredictable finish with two made field goals, which would be shots made other than free throws, completed in the final 2.7 seconds of the game. Adding context, the game drew comparisons to the 2nd-round game in 2010 when Northern Iowa knocked off another Big 12 favorite, Kansas, who was the number-one overall seed in that year's tournament.

UNI's upset at the buzzer against Texas also added the Longhorns to the list of eight teams that were seeded in the top 24 overall teams in the 2016 tournament to lose in their first game. At a certain point, the clock strikes for all the Cinderella teams, such as both the 2010 and 2016 Northern Iowa squads hoping to leave their mark on the Big Dance that is the NCAA tournament, leaving only the most talented and well-coached teams to do battle until a single

school can be crowned the best of the best after the buzzer sounds on the day of the National Championship.

While the early rounds of the tournament are a different kind of fun for fans and players alike, watching the very best compete in the Final Four and National Championship is still the main draw in college basketball. The tournament averaged 10.4 million viewers as a whole in 2017, but the Final Four alone averaged 16.8 million viewers (Conviva, 2017), clearly signifying that even if a fan's bracket is busted, meaning the teams they were rooting for or expecting to still be playing in the tournament are eliminated, the allure of the tournament does not dissipate. In order to reach a Final Four, teams must win a minimum of four consecutive games, putting their season on the line every time they take the court. Even back in 1982, when CBS gained the rights to air the NCAA tournament, there were 48 teams, meaning at least three games were required to advance to a Final Four (NCAA, 2011). The grueling journey to reach a Final Four creates many storylines itself. Close encounters with defeat, injuries to key players, the rise of a young star, and complete and utter domination are all possibilities for teams still playing at the end of March.

Each of these potential occurrences gives the broadcast team options to shape the narrative prior to the game's beginning. Just like the two teams competing on the court, members of the broadcast production team must be at their best. A successful broadcast takes preparation. Watching film, analyzing tendencies, and trying to get into the minds of the coaches are all necessities prior to the tip of the ball. The best way to emphasize these points is with factual data of players and team performances on the court — known as basketball statistics.

Statistics can be used before the game to make predictions or to emphasize takeaways, but they are just as useful during the game to quantify the execution of both teams. Statistics can

be influential in looking into a team's game plan. Take, for example, North Carolina's (UNC's) 2017 national championship team. They led the NCAA in rebounding margin, out-rebounding opponents by a margin of 14.2 per game (Martin, 2017). Going into the championship, North Carolina's opponent, Gonzaga, knew it would be critical to avoid being dominated on the glass so as not to allow UNC second opportunities each possession to score. Ultimately, UNC was able to surpass its season average in rebounding, but Gonzaga was able to keep the rebounding stat competitive, only pulling down two less boards than Carolina, one of the important factors that contributed to them keeping the game close — even though they were the underdog.

Moreover, statistics are one of the most useful tools that can be used in games to portray how a team or player is performing. They can be used to back up claims that a player is having "one of his best games ever" or that a team is having "an uncharacteristically rough outing." By utilizing statistics and incorporating them into the production of a broadcast, fans are given additional insight that can make their viewing experience more informative and enjoyable.

If incorporating these statistics into broadcasts are making the viewing experience more enjoyable for the average fan, knowledge of this trend would be very useful for broadcast producers, directors, and statisticians. The prevalence of statistics would be stressed so that they are displayed graphically and referenced audibly to give the optimal viewing experience for the fans at home. If statistical analysis is taking higher priority in terms of defining a successful show, knowing what works best will keep the viewers satisfied and ensure that they are tuned in the next time their team takes the floor.

Literature Review

New technological developments give television broadcast producers and directors more opportunities to entertain and inform their audiences by incorporating different, never-before-seen features into their broadcasts. These features predominately are in the form of graphical statistics. They can tell the story of the game in a clear and visually appealing manner that will retain fans' attention and keep them interested in the action even if the viewer doesn't have a major rooting interest for either team in play (Vizrt, 2013).

There have been several studies conducted on the influence technology has had on sports broadcasts. For example, there has been a noticeable increase in revenue coming from the most popular sports, primarily through football, baseball, and basketball, due to technology (Budzinkski & Satzer, 2011). Roger Noll notes in his study over broadcasting and team sports that broadcasting is part of the information-technology sector, providing news and entertainment to a widespread audience due to advancements in technology. The two main elements in the information-technology sector — technology and public policy — have undergone major developments in the past two decades. Professional sports leagues are expanding to new cities, bringing in additional viewership, and leagues are creating their own networks, such as the NFL Network and the SEC Network, so that more of their content will be visible. These changes have helped the percentage of total revenue each major sport — basketball, football, and baseball — has derived to grow by half or more (Noll, 2007).

It is apparent that technology has piqued and retained the public's attention, but the next question is what specifically in the technology is spurring this growth in revenue. While there may be a multitude of contributing factors thanks to technological improvements such as clearer

pictures, more angles, and faster response times, it is necessary to explore what could make a difference in the overall enjoyment of watching the games.

Research into the industry of televised sports broadcasts conducted by Silk, Slack, and Amis (2000) concluded that analysis of televised sports is based on one's understanding of viewed pictures and symbolic imagery. In other words, how a sporting event is viewed relies upon the technology that can be implemented, which will provide the audience additional imagery for better understanding. That imagery does not necessarily have to be visual; for Cummins and Gong (2015), their research question was whether the sound of an audience present can enhance the perception of a game. Their study found that stressing the microphones used to pick up reactions from the crowd at a live event does influence a viewer into believing that the event is more exciting or meaningful. This is a prime example to demonstrate the fact that effective technology can be implemented to increase television ratings and keep viewers entertained. One of the other noticeable tools in sports broadcasts are the use of statistics to convey storylines and narratives. This research studied the evolution of incorporating statistics — both audibly and visually through graphics — in NCAA Championship broadcasts.

The Tools of a Broadcaster

The goal of any sports broadcast should be to provide the on-air commentators a variety of tools at their disposal to push the story any way they want depending on how the action before their eyes develops. Fresh and new graphics to display and explain what is occurring in a game are continually being created to tell the most effective story possible. In-game graphics today are the highlighting feature of the information design available (Gadney, 2012). Analysts must use numbers when trying to display a good performance. Two players could have the same amount of points in a game, but by presenting additional statistics such as field-goal percentage and

turnovers, the broadcasters can give a clearer picture as to whose performances are particularly noteworthy (Kucharski, 2016). The data that is necessary for a certain point or notion that the commentators are conveying can be represented by a graphic of any size and any location on-screen based on how much information it contains, and it can be injected into the broadcast for as long as it is deemed useful (Gadney, 2012). The results, when properly executed, can be balanced, informative, and add to the fans' overall viewing experience.

Graphics Used to Represent Statistics

The extensive use of graphics has not always been prevalent in regards to televised sports broadcasts. As recently as the 1990s, there are instances where there was live action presented on the screen with no visuals whatsoever to inform viewers what the score was, how much time was left, or even who was playing (Leitch, 2012). Some of this was due to the technology available at the time, but another factor may have been that the storytelling experience the broadcast was attempting to present back then did not call for the constant inclusion of graphics.

When discussing innovations that have changed sports broadcasting, Nachman and Bennett (2011) point to two instances where graphics played a major role: in 1965, which was when the first on-screen graphics were used in a sports broadcast during a World Series baseball game, and then 10 years later, when statistics were periodically updated throughout the course of a game (Nachman & Bennett, 2011). However, these weren't the updates that viewers are used to seeing today. Back then, a statistic would be presented and then removed from the screen. If it needed to be updated before being displayed again, then the new information would have to be processed through an archaic data device beforehand.

The second major development, as noted by Nachman and Bennett (2011), are the graphics viewers are more accustomed to today, particularly usage of an information "ticker."

During the 1996 baseball season, SportsVision created what was coined as the "Fox Box", a constant, on-screen graphic — one that contained the most vital information pertaining to the game — in a little box (Nachman & Bennett, 2011). Over the years, this box has been modified and streamlined to provide all the necessary information for any particular sport in a single location on the screen. This "Fox Box," later referred to as a ticker, provides current information, usually in the lower third of the screen (Folger, 2018).

Visuals as a Potential Distraction

In recent years, there have been complaints from a portion of viewers that the information and visuals on the screen are distracting from what is actually taking place behind all those graphics (Leitch, 2012). There is no exact science or universal opinion to determine how much information should be displayed constantly throughout a broadcast or how much should be briefly included to support a storyline or pose as supplemental detail, but as in most cases, the best answer is probably somewhere in the middle. As Leitch (2012) mentions, with each year, the major networks are continually working to improve their respective graphics by giving fans additional information based on feedback from people watching the broadcasts, by what graphics and effects add to the experience, and which ones are considered distracting. These minor adjustments and transformations hope to bring the highest level of entertainment to the fans at home.

My Study

The focus of this study was centered on the change in collegiate basketball broadcasts due to advancements in technology, but the focus on new technology was in the form of the graphical representation of statistics. This study analyzed collegiate men's championship basketball broadcasts from the 1980s to present day in predetermined intervals to encompass the

full transition from seldom-used graphics on screen to today's viewing culture, where statistics are discussed and displayed much more frequently. The primary, overarching research question is: How has the utility of graphics that contain statistics changed within each championship broadcast of the NCAA tournament from the 1980s to today?

In order to answer this question, each graphic displayed during selected championship games was documented and analyzed, specifically noting: (1) the amount of TV screen space consumed by the graphic, (2) the length of time the graphic was displayed on the screen, (3) the type of statistic contained in the graphic, (4) the length of time the broadcaster audibly highlighted the statistic, and (5) the percentage of statistics referenced audibly that were accompanied by a graphic.

In outline format, the following research questions guided this study:

1. How many graphics that contain statistics occurred within each NCAA basketball championship broadcast from 1986 to 2016 as observed in five-year intervals?
2. For each graphic documented:
    1. What is the amount of TV screen space consumed by each graphic?
    2. What is the length of time the graphic is displayed on screen?
    3. What is the context of the statistic contained in the graphic? (For example, is it a team-oriented or an individual statistic?)
    4. What is the length of time the broadcaster audibly highlighted the statistic?
    5. What is the percentage of statistics referenced audibly that were accompanied by a graphic? (For example, when a statistic is mentioned by the commentators and there is a visual on screen to accompany it.)

Method

To execute this study, I accessed the full broadcasts of most of the NCAA Championships dating back to 1980. These games have only been edited to cut out the commercials, so everything necessary for my study was available to me. I decided to focus on only the final game of each tournament since that is the game that receives the highest rating most years (Otterson, 2017). The championship also does not have to compete with any other games going on simultaneously or upcoming, so most of the graphical content of the broadcast is focused on the event unfolding on that single court.

CBS has covered the Men's NCAA Championship every year since 1982. The most recent full game accessible was the 2016 matchup between North Carolina and Villanova. From there, I analyzed the championship game in five-year increments, meaning the games observed in this study are the championships from the 2016, 2011, 2006, 2001, 1996, 1991, and 1986 seasons. Due to time restrictions and limited resources, these seven games were deemed the best way to cover a span of 30 years, as the changes in the broadcasts from year to year weren't so drastic that it was necessary to encapsulate every single year.

For each of the seven games, I kept data regarding graphics via columns in a spreadsheet pertinent to each of the aforementioned research questions. Any time a graphic appeared on screen or a statistic was spoken by a commentator, a row was added to the spreadsheet noting all the specifics of the content used.

- For research question one, whenever a graphic was displayed on screen, the first column contained a title of the graphic being presented.

- For part one of research question two, a grid covered the screen, and the graphics were boxed off and rounded to a tenth of a decimal to produce the closest estimate of how much screen space was used for any given graphic.
- For part two of research question two, graphics were noted by the amount of game time as well as real time they were displayed on the TV screen.
- For part three of research question two, the context of the graphic was noted, whether it was a comparison between the two teams in the contest or an observation for a specific team or a specific player. This section was completed regardless of whether the statistic was presented audibly or visually.

Specifically, whenever a broadcaster began referencing numbers about the game or one of the teams on the court, that was also charted as a statistic utilized audibly. The only exception was when a commentator simply provided information on the play; in those instances, no statistic was charted. For instance, if a commentator informed the viewers that a player committed his third foul and there was no graphic accompanying this statement, then it wasn't charted; however, if he continued to say the player shooting free throws was six for eight from the line, then that was charted since it provided more information than what occurred at that immediate point in time in the game, which made the reference statistical.

When an audible statistic was charted, the notation included:

- From part three of research question two, the type of statistic, whether that be a team or a player referenced, was noted the same as it would have been when a graphic was displayed.
- From part four of research question two, the length of time in the broadcast that was used to provide that statistic. These were once again measured in real time and in game time.

- From part five of research question two, a denotation of the audible statistic to signify that it was presented audibly and not graphically. If both a graphic and an audible reference were provided to convey a statistic, then all of these categories were filled on the spreadsheet.

Once statistics were charted in each championship game from the seven games selected, I aligned the values from each year to identify and analyze trends in the data. Some of the prevalent questions explored through this data set include: Were more graphics prevalent from year to year chronologically? Were more statistics accompanied by graphics as the years go on? Also, an important thing to note was the total amount of statistics compared to the total broadcast duration from each year so that technology was not an outside factor as to why some years there may have been more time allotted for the use of statistics, whether that be audibly or visually.

In other words, just because there were less graphics available in early years, that does not mean that statistics weren't still a vital part of the gameplay. The reason for noting both visual and audible statistics was to see if there was change overall in the prevalence of statistics in basketball broadcasts, even if it was more challenge to convey that on-screen in earlier years.

Results

The purpose of this study was to analyze the use of statistics — referenced audibly and/or presented graphically — over a span of 30 years to understand how the components of a basketball broadcast have been altered and whether changes are just being propelled by advancements in technology. Spoken statistics have always been prevalent in sports broadcasts, long before graphics entered the business. The longevity of statistics can be credited to its ability as a great resource when conveying a talking point or contributing to a storyline.

Results revealed that some statistics are used more frequently in recent years, and some have always been present throughout the span of this study. The way the data is presented, either audibly or graphically, can have an impact when determining the usefulness of incorporating that particular statistic. It is important to analyze the trends that appear over time within this study to gain an understanding of what content may be more or less prevalent in future basketball broadcasts. The specific content observed in each of the seven games analyzed was as follows based on this study's predetermined research questions:

1. How many graphics that contain statistics occurred within each NCAA basketball championship broadcast from 1986 to 2016 as observed in five-year intervals?
2. For each graphic documented:
    1. What is the amount of TV screen space consumed by each graphic?
    2. What is the length of time the graphic is displayed on screen?
    3. What is the content of the statistic being contained in the graphic? (For example, is it a team-oriented or an individual statistic?)
    4. What is the length of time the broadcaster audibly highlights the statistic?

5. What is the percentage of statistics referenced audibly that were accompanied by a graphic? (For example, when a statistic is mentioned by the commentators and there is a visual on screen to accompany it.)

Research Question 1

The first calculation was the number of statistics represented graphically in each game. There was a notable difference in the first three games as opposed to the most recent four games analyzed in this study. In the 1986, 1991, and 1996 game, for the majority of the actual game time, there were no graphics on the screen whatsoever; rather, only the image of the action on court was visible. The score was usually only present after a team had scored and would subsequently flash away.

For that reason, there was a skew in the number of total graphics utilized because the graphic presented when the score changed (i.e., the ticker) appeared much more frequently in numerical value in the first three games observed. Every time the ticker was shown on screen, it was included each time in the results for research question one. By contrast, since the ticker was present throughout the entire broadcast of games after 1996, it was only counted once. In other words, in the earlier games, it was included every time it flashed on screen, essentially counting the same graphic over and over again. For that reason, a second column was created to display the results from research question one. In the second row of Table 1.1, the ticker is not included in the graphics counted for each game. The ticker is defined as the baseline statistics necessary to give viewers the most fundamental knowledge of what is occurring throughout the game: For the first three games observed — 1986, 1991, and 1996, the ticker included just the teams playing and the score, and it has since developed to include the game-time remaining, the shot clock, and the seeds of each team (Figure 1).

Table 1.1. Total Number of Graphics in Each Championship Game

	1986	1991	1996	2001	2006	2011	2016
Ticker included	108	106	84	67	65	69	72
Ticker not included	44	28	24	44	48	57	60

The second row in Table 1.1 accounts for the unexpected skew in results. The games in blue were the ones largely affected by the ticker.

The results show that — when excluding the ticker — the total number of graphics have increased over 30 years, as each of the last three games analyzed have the most total graphics. The most graphics observed was in the 2016 championship game, and that game had more than twice as many graphics as the games observed in the 1990s. While there were more graphics in the earliest game, i.e., 1986, that could be a potential outlier since every other game included more graphics than the game prior to it.

Figure 1.1. Comparison of the "ticker" in 1986 compared to 2016

Figure 1.1. Comparison of "tickers" from 30 years apart. Notice the difference in size and the difference in the amount of information contained in each.

Research Question 2

While identifying the sheer number of graphics for each game does provide information about the mere presence of graphics, the second research question takes another step further by providing details about each of the graphics that were displayed. For every graphic that appeared, it was labeled with a title, then measured for percent of screen space consumed by overlaying a grid over the image, timed for how long the graphic appeared on screen, and finally categorized as either a specific team, comparison of teams, specific player, or comparison of players.

Moreover, in order to avoid being too reliant on technology (i.e., usage of graphics), all spoken statistics by the commentators were recorded as well, since even in the earliest games observed, technology did not prevent statistics from being orally inserted into the broadcasts. For spoken statistics, similar parameters were charted: A title was given, the amount of game-time spent stating and discussing the statistic was noted, and the data was categorized by the same four categories as statistics provided through graphics.

When a spoken statistic was coupled with a graphic to complement the point, or vice versa, both the columns in the coding template for visual and audible statistics were filled (see Appendix A and Appendix B). Depending on the particular kind of data, after each game, the

numbers were compiled and organized. For instance, length of time — for both visual and audible references — were combined into total run times, and the screen space of each graphic was averaged to give the general sense of size occupied.

Table 1.2. Categorized Results to Research Question Two

	1986	1991	1996	2001	2006	2011	2016
Screen Space (average)	18.4%	21.3%	13.5%	8.3%	6.1%	3.5%	6.5%
Visual Length (combined TRT)	:40	:25	1:24	1:32	4:45	6:50	4:12
Audible Length (combined TRT)	6:04	3:46	3:56	2:06	5:36	3:43	3:50
Stats with Graphic (percentage)	50%	32%	31%	64%	30%	53%	71%

Each row is the result of one of the subheads directly related to Research Question 2.

While there is a lot of data contained in Table 1.2 to comprehend, following a single row from year to year can show how statistics in collegiate-championship basketball broadcasts has been trending. For example, the size of graphics has generally become more concise by occupying less space on screen in recent years, as demonstrated in Figure 1.1. However, while the graphics have become smaller, their amount of time spent on screen has been growing. The total run time (TRT) is based off the 40 minutes of game time, meaning that in the most extreme cases observed — i.e., in 1991— less than 1/2 of a minute out of the full 40 was a graphic

outside of the ticker presented on screen. On the other end, in the 2011 broadcast, over 15% of the game time included an additional graphic outside of the ticker. Finally, the length of time the broadcasters spent discussing statistics during the game varied from year to year, as there was no particular trend in that category. In three of the last four games observed, the majority of the statistics were, in fact, accompanied by a graphic.

Implications

After hours of reviewing game tape and compiling data from the broadcasts, the results show that basketball broadcasts have made an effort to provide more information to the viewers in the form of graphics containing statistics. Due to the variety of numbers that are available to television broadcast directors, a specific theme or storyline can be continually conveyed without having to re-hash the same numbers constantly. Large inputs of raw data are allowing broadcasters to refine statistics. Efforts are being made to use that refinement by incorporating statistics — some graphical and others audible — with more recent impact on the game rather than those that merely highlight broader generalizations. The statistics are being presented both visually and audibly at a higher rate, allowing the viewers more opportunity to immerse themselves in the action. The size of the graphics also allow viewers to remain focused on the action, only turning their attention to the statistics on screen if they choose to do so.

Take, for example, the 2011 National Championship between Butler and Connecticut. Butler shot poorly in the game, managing only 41 points in total, the fewest points scored by a single team in a championship game since 1949 (NCAA, 2018). Clearly that is a big storyline throughout the game, as Butler went through long stretches without scoring at all in both halves. To portray this anomaly, a variety of different graphics were used — just in the second half alone — that presented different statistics but provided the same talking point: Butler was struggling to score points. For instance, there was a graphic comparing Butler's worst scoring drought in the first half to their drought in the second half. Later, another graphic flashed on screen, showing that Butler had been outscored 20-6 at one point in the second half, but the most telling was a comparison with less than seven minutes to go in the game: UConn had more blocks than Butler had shots made, with nine and eight, respectively. Even though Butler was only down 13 points,

that graphic alone signified how daunting and unlikely it would be for Butler to come back and win the title.

These types of new comparisons and different findings have advanced the use of statistics as a tool during in-game broadcasts. With data being collected at a faster rate, more information can be disseminated to viewers with the hope that it will improve their viewing experience. Casual viewers as well as hard-core fans can benefit from the newfound uses of graphics in television broadcasts. For the casual fan, things like a player's points or points per game can be useful to know, particularly who to keep watching and if a player is exceeding or struggling to meet expectations on that day. Other statistics such as specific game-related categories where a team is excelling or is deficient may be more influential in how a fan who watches that team play or spends more time following the sport in general views the game.

Some of the stats that become more prominent in more recent championship games are points of data categorized as recency statistics. Instead of outlining how a team or player has performed throughout the entire game, these statistics focus on performances just over the last few minutes or possessions (see Figure 1.2). This insight puts more emphasis on how a team has been playing recently, as that can be a good indication of the direction the game is trending and can be a better predictor of the outcome, one of the primary reasons fans watch the broadcasts.

Figure 1.2. Examples of Recency Statistics

The graphic on the right shows Butler's scoring struggles during the 2011 championship.

When connecting these results back to the literature review, there are more tools available for television broadcasters now than before. Tools such as a quicker response time and clearer pictures for replays, more exposure to the athletes, and a larger pool of data all help to create talking points for broadcasters. Focusing solely on statistics, the amount of data being presented today is much more detailed than the data shown 30 years ago.

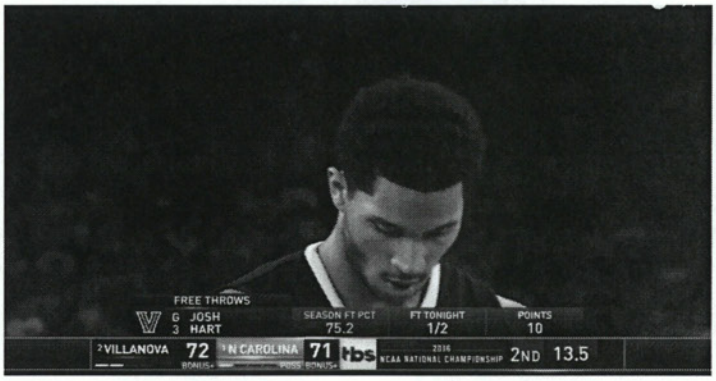
In a study conducted by Akers, Wolff, and Buttross (1992), their results indicated that the important factors in a player's success are 2-and 3-point field-goal percentage, rebounds, steals, and turnovers. While these statistics are still the baseline for analyzing play, both teams and television broadcasts have taken these numbers to the next level by adding variables and sub-categories to give more context. In particular, specific field-goal shooting from inside the paint, i.e., the area between the hoop and the free-throw line, or from the corners behind the three-point arc are appearing in broadcasts as well as a player's performance when being guarded by a specific player. While there are more numbers available for broadcasters to use, statistics haven't been used more in recent broadcasts. Broadcasters are being more selective about when to introduce a statistic to the game, but when they are applied, they do a better job explaining the

game action or player performance because they can be refined to pinpoint the specific statement that the announcer is making.

Another reason statistics may be having a stronger effect is because the spoken statistics are being coupled with graphics that complement the points being made at a higher rate. This discovery is not as blatant to notice because the numbers aren't continually trending up from each game to the next, but overall, there has been more consistency with a graphic being associated to a point the broadcasters are in the middle of discussing. Any time multiple forms of media can be used to convey content, it is more likely that the audience takes notice and uses that information to benefit their experience. People tend to be visual learners, so having numbers visibly present to accompany the additional commentary provided by the broadcasters is one of the most simplistic yet noteworthy ways that the utilization of statistics has evolved.

When the ball is in play and live game action is the focal point of the television broadcast, that is when the graphics must be the supplement to the commentary as opposed to stoppages in play where the graphics can dominate a larger majority of the screen space. Another big area of improvement recently has been the size of graphics during live game action. The size of the ticker as well as other graphics that flash on screen mid-game have reduced in size from by 400% in the last 20 years. The average graphic between the 1986 and 1991 games occupied 20% of the screen, and the average size between the 2011 and 2016 games was just 5% while supplying just as much data (see Figure 1.3), or in most cases, even more information. While Leitch (2012) does note that critics will argue that the amount of information provided in a ticker today can be sensory overload, it is all included in a compact and seamless way that it does not distract a viewer but can be comprehended if desired.

Figure 1.3. Newest Observed Ticker



Important late-game variables such as timeouts remaining, team fouls, and the possession arrow are discretely included here.

One of the main reasons the tickers include more pieces of information while not taking up any more screen space is because of the nationwide switch from analog to digital television in 2009 (University of Minnesota, 2016). This switch changed the screen-aspect ratio to 16:9 from the original 4:3 format. The new aspect ratio allowed for widescreen and high-definition (HD) television viewing. The aspect change was apparent in this study, as only the 2011 and 2016 games had the wide-screen appearance. Numbers could be introduced on screen in much smaller fonts while still appearing legible thanks to the HD image quality. The incorporation of high definition allowed numbers and images to be displayed on-screen in smaller sizes while still being legible. Now graphics can appear on screen for longer periods of time because they aren't competing with the action on the court if the camera is framed properly. This minimization of graphic sizes may have had the largest impact on the total prevalence of graphics shown on screen.

Study Limitations

While this study did bring about noteworthy findings per the aforementioned subheads, its biggest limitation was only analyzing seven championship games. Being able to increase the

sample size could have provided an opportunity to test and derive significant inferential statistics, but the duration that was necessary to analyze each game did not provide enough time to include additional games and code more graphics.

Moreover, while the network providing the game broadcasts was consistent, as CBS and Turner Sports have been the home of the NCAA Tournament since 1982, the in-game commentators were not the same throughout the 30-year span. Each television broadcaster brings a different style and approach to the game, which could account for some variability of statistics used, but by only analyzing the championship game, the broadcasters observed throughout this study were not always consistent. Having said that, since it was the championship game, the study was able to focus on who CBS deemed their best pair, or trio of commentators at the given date, so there is little concern that the results would be altered because of poor announcing; rather, this just denotes different stylistic approaches.

Future Research

If this study were to be taken to the next step, then one potential option could be discussing the research questions asked here with people who are more familiar with this topic. Getting insight from television broadcast directors or statisticians who work national basketball broadcasts, the commentators who provide their own knowledge of the sport, and/or fans who have been watching basketball for decades could be beneficial in advancing the foundation that has been constructed in this study. This information could explore just how effective the uptick in graphical use and variety has been in regards to fan enjoyment and involvement in the growth of the sport.

Another possibility would be to address the difference in graphics and statistics for a women's collegiate championship game as compared to a men's final. Men's games garner a

much higher viewership than women's games. According to Sports Media Watch and Variety, the 2018 NCAA championship games brought in a 10.3 and 1.9 rating for the men's and women's contests, respectively. If the ratings affect the quality of production, it would be interesting to see if the amount of statistics and utilization of them play any role in discrepancy between the perceived interest of men's and women's games.

Final Thoughts

Statistics will remain a staple in sports throughout time, as there is no more efficient way to provide commentary on a team or athlete. Additionally, statistics can be used in myriad ways to shape an opinion or provide evidence on a statement. While the increase in and evolution of technology has changed graphical representations of statistics over the last 30 years, the increase in the frequency of statistics presented could benefit basketball broadcasts going forward. This study shows that the increase in the amount of graphics — as well as the variety of statistics available — plus the pairing of visual statistics with audible statistics in recent years provide evidence that the utilization of graphics and statistics have become an even more important tool for basketball broadcasts.

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Appendix A: Page 1 of 1996 Coding Template

Graphics	Screen Space (%)	Length (# sec)	Type (team or individual)	Comment Length (# sec)	Stats SAID w/o gfx (#)
			team	7 secs	Kentucky won last year 77-71
			team	17 NC 6	Syracuse 33 TOs in that game, UK 25, most for both teams since
Team, score half, logo	11.2	2	team	3	First points of game scored by Wallace
Turnovers	7.6	3	team		
Team, score half, logo	11.2	2	team		
Clock	1.2	4			
Turnovers	7.6	2	team	9NC 2	Five TOs saturday, already 3 today for Syracuse
Syracuse TOs	18.1	6	Syracuse team		
Team, score half, logo	11.2	1	team		5-2
			Kentucky player	2	9 points for Mercer saturday
Team, score half, logo	11.2	2	team	1	5-2 Kentucky
Clock	1.2	4			
Team, score half, logo	11.2	2	team		
			Kentucky player	3	Delk hits his 2nd three pointer
			Syracuse player	5	Sepoula's biggest game he had 25
Team, score half, logo	11.2	2	team		
Clock	1.2	5			
Team, score half, logo, ship + clock	12.4	1 NC	team		
Team, score half, logo, ship + clock	12.4	7NC 2	team		
			team	4 NC	Kentucky 33-2 on the year, while Syracuse 29-8
Field goals	8.8	3	team		
Syracuse TOs	18.1	4	Syracuse team	4	Matched Tos from saturday already
Team, score half, logo	11.2	1	team		
Clock	1.2	5	t		
Team, score half, logo	11.2	2	team		
Clock	1.2	6			

Kentucky shooting, 2 pts, 3 pts	9.4	3	Kentucky team		
			Syracuse team	2	Sixth TO for Syeracuse
Team, score half, logo	11.2	2	team		
Clock	1.2	4			
			Syracuse player	8	Burgen, 6 for 11, 7 rebs 19 points vs Miss St
Team, score half, logo	11.2	2	team		
Clock	1.2	4			
			Kentucky player	3	Delk knocked down 3 3s already
Sims fouls	10.6	3NC	Syracuse player		
Anderson Tourny avgs, pts, reb, asst	16.9	2NC	Kentucky player		
Team, score half, logo, ship + clock	12.4	2	team		
Season Attendance	68.2	8NC	team	7 NC	Two highest season attendance averages
Team, score half, logo, ship + clock	12.4	8NC 1	team		

Appendix B: Page 1 of 2006 Coding Template

Graphics	Screen Space (%)	Length (# sec)	Type (team or individual)	Comment Length (# sec)	Stats SAID w/o gfx (#)
team, score, half, time and logo	5.2	19:57	team		
team colors	6.7	2NC	team	3	UCLA in white because they were a better seed
Consecutive wins	6.7	3	team		
10-0 nuetral site games	6.7	3	florida team		
11-1 all time in championship games	6.7	3	ucla team		
Shot clock	1.9	10	ucla team		
Shot clock	1.9	3	ucla team		
			team	8	Both teams beat Alabama, LSU and Albany
Tourn wins by avg of 16 points	6.7	4	florida team		
			Ucla team	7	UCLA looking for a 3rd SEC conquest tonight
Bozeman year positrion and major	18.4	3NC	ucla player	3NC	Has started at 4 positions in his career
			ucla palyer and team	6NC	11-17 team 2 years ago
Bozeman points, reb, assts in tourn	18.4	3NC	ucla player		
			florida player	5	6'8 size of Brewer that surprises opponents
			ucla player	6	17 and 9 for Mbah amoute saturday
Shot clock	1.9	6	Ucla team		
National Championship History	100	9NC	team	9NC	2nd title game for florida
				10NC	UCLAs only title game loss happened in this city in 1980
Bozeman points and free throws	18.4	3NC	ucla player		
				5NC 10	UCLA in final four is 26-4
Shot clock	1.9	4	florida team		
Field goals	3.9	4	team		
			florida player	3	24 blocks in tourn for Noah
team, score, half, time and logo	19.1	2NC	team		
Florida 9-2 run last 2:08	10	3	florida team		
Field goals	3.9	3	team		

Shot clock	1.9	8	ucla team		
florida 5 fgs in last 5 possessions	10	4	florida team	4	Florida hit its last 5 shots to gain early edge
Field goals	3.9	3	team		
3 point field goals	3.9	2NC	team		
Turnovers	3.9	3NC	team		
Points in paint	3.9	3NC	team		
Farmar points and fgs	3.8	4	ucla player		
			florida player	3	Brewer picks up a 2nd assist
Turnovers	3.9	3	team		
			florida player and coach	5	Moss has been at florida for half of Donovans tenure as 5 year senior
			ucla team	6NC	Only 1 team has scored over 60 points in their 12 game win streak
			florida player	4	Moss lead the team in drawing charges on season
Shot clock	1.9	10	florida team		
UCLA fgs made and turnovers	10	5	ucla team		